169.1469 PATENT APPLICATION

#61 Priority Papers Cmasha 4/27/00

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	)	
SEPPO REINO KERONEN ET AL.	)	Examiner: Not Yet Assigned
Application No.: 09/414,558	)	Group Art Unit: 2876
Filed: October 8, 1999	)	
For: A USER PROGRAMMABLE SMART CARD INTERFACE SYSTEM	)	January 3, 2000

Assistant Commissioner for Patents
Washington, D.C. 20231

CLAIM TO PRIORITY

Sir:

Applicants hereby claim priority under the International Convention and all rights to which they are entitled under 35 U.S.C. § 119 based upon the following Australian Priority Applications:

PP6419, filed October 8, 1998;

PQ0290, filed May 11, 1999;

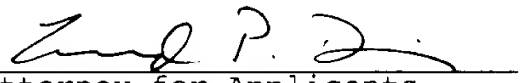
PQ0289, filed May 11, 1999; and

PQ1852, filed July 27, 1999.

Certified copies of the priority documents are enclosed.

Applicants' undersigned attorney may be reached in our New York office by telephone at (212) 218-2100. All correspondence should continue to be directed to our address given below.

Respectfully submitted,



Attorney for Applicants

Registration No. 29,496

FITZPATRICK, CELLA, HARPER & SCINTO
30 Rockefeller Plaza
New York, New York 10112-3801
Facsimile: (212) 218-2200

NY_MAIN 51564 v 1

AUSTRALIA

Patent Office
Canberra

I, LEANNE MYNOTT, TEAM LEADER EXAMINATION SUPPORT AND SALES hereby certify that annexed is a true copy of the Provisional specification in connection with Application No. PQ 0289 for a patent by CANON KABUSHIKI KAISHA filed on 11 May 1999.

I further certify that pursuant to the provisions of Section 38(1) of the Patents Act 1990 a complete specification was filed on 07 October 1999 and it is an associated Application to Provisional Applications Nos. PP 6419, PQ 0289, PQ 0290 and PQ 1852 and has been allocated No. 53527/99

WITNESS my hand this
Twenty-eighth day of October 1999

3

L. Mynott

LEANNE MYNOTT
TEAM LEADER EXAMINATION
SUPPORT AND SALES

S & F Ref: 454898

ORIGINAL

AUSTRALIA

Patents Act 1990

PROVISIONAL SPECIFICATION FOR THE INVENTION ENTITLED:

A Programmable User Interface for a Customer Terminal

Name and Address of Applicant: Canon Kabushiki Kaisha, incorporated in Japan, of 30-2, Shimomaruko 3-chome, Ohta-ku, Tokyo, 146, JAPAN

Name of Inventors: Philip Keith Robertson and Sue-Ken Yap

This invention is best described in the following statement:

A PROGRAMMABLE USER INTERFACE FOR A CUSTOMER TERMINAL

FIELD OF THE INVENTION

The present invention relates to programmable user interfaces for customer terminals, and in particular, to user interfaces based upon the use of smartcards.

BACKGROUND

Customer terminals, and in particular those terminals directed to voice communications ie. telephony, are to some extent provided with programmable user interface features. Thus, for example, there are telephone terminals which have a memory function for use in storing frequently used numbers. In some configurations, telephone terminals can store numbers in plug-in smartcards, or similar type of portable storage media. The term "smart card" is a recognised industry term for credit-card size devices having an on-board computer chip and means for connection thereto.

The current configurations for these storage media typically lend themselves to one-off use. Thus, the GSM cellular phone is activated by inserting a SIM module, (Subscriber Identity Module) which contains information concerning the subscriber. While the SIM module may be removed by the customer, thus rendering the handset useless, typically the SIM module is inserted when the cellular telephone is purchased, and remains in the telephone for the life of the instrument, barring unforeseen circumstances such as repairs. The potential of such programmable devices as the SIM, in particular as they relate to the issue of "customised" user interfaces, is thus utilised only to a very limited extent.

When considering programmable memory modules such as are exemplified by the SIM module, the user is immediately faced with the issue of storage, indexing, and retrieval of appropriately programmed interface cards, once the user has a number of these cards in his possession. The problem may be easily understood by considering, for example, a product called a "Rolodex"™ which is used for systematic storage and retrieval of business card information. This product attempts to overcome the problem presented by the need to store a multiplicity of cards, each one containing similar but not necessarily identical information fields. Returning to the issue of programmable customer-interface storage modules, a similar problem arises, namely the issue of being able to retrieve a desired card from a "box" or other physical storage means.

Given the availability of the aforementioned programmable user interface storage module, to provide the maximum benefit to a user a means for programming such modules is required.

The present invention is intended to more fully exploit the potential of the programmable insertable memory module.

SUMMARY OF THE INVENTION

Therefore, in one aspect the invention discloses a user programmable interface system comprising;

a smart-card;

a smart-card reader adapted to receive the smart-card, and responsive to a user stimulus to a region on or above a surface of the card, the reader being further adapted to output a signal in response to the stimulus, the signal comprising a user programmable sequence of one or more signal components;

a customer terminal adapted to incorporate the smart-card reader, the terminal being responsive to the output signal from the reader; and

a base station adapted to communicate with the customer terminal, and to perform, on the basis of the output signal, at least one of establishing and supporting a telecommunication connection, and initiating and controlling a process.

In a second aspect, the invention discloses a smart card for promotional use, said card suitable for incorporation into the aforementioned programmable interface system.

In a third aspect, the invention discloses a smart-card programming apparatus comprising:

a smart-card reader means adapted to receive a smart card and to read from and/or write to the smart-card;

a region position definition means by which a region position can be specified;

a smart-card printer means;

a region graphic definition means by which a region graphic can be specified; and

a region action definition means, by means of which a region action can be specificed wherein the apparatus programs the smart-card dependent upon the specified region position and region action, and wherein the apparatus further prints the specified region graphic on the smart-card in the corresponding region position.

In a fourth aspect, the invention discloses a smart-card indexing apparatus comprising;

a smart-card storage means adapted to receive at least one smart-card;

a smart-card reader means adapted to read data from a smart card located in the storage means;

a search query means whereby a user can specify at least one smart-card parameter; and

a control means responsive to the data read by the smart-card reader and adapted to identify a smart-card dependent upon the specified parameter.

BRIEF DESCRIPTION OF THE DRAWINGS

A number of preferred embodiments of the present invention will now be described in more detail with reference to the accompanying drawings, in which:

Fig. 1 depicts a generic smartcard with programmable/customised regions;

Fig. 2 depicts a preferred embodiment of a one-touch customised smartcard for telephony applications;

Fig. 3 presents a preferred embodiment of a cordless telephone adapted for use with a customised smartcard;

Fig. 4 depicts a preferred embodiment of a public telephone adapted for use with the aforementioned smartcards;

Fig. 5 presents another embodiment of a smartcard directed towards a control function;

Fig. 6 presents a process flow diagram of a preferred embodiment from the user perspective;

Fig. 7 presents a process flow diagram of a preferred embodiment from the card reader perspective;

Fig. 8 depicts local visual feedback on the surface of a smartcard;

Fig. 9 presents a process flowchart for a preferred embodiment of a programming/printing apparatus; and

Fig. 10 depicts an indexing apparatus in a preferred embodiment.

DETAILED DESCRIPTION

In the context of this specification and claims, the word "comprising" means "including principally, but not necessarily solely". Variation of the word "comprising", such as "comprise" and "comprises" have correspondingly varied meanings.

Fig. 1 depicts a smartcard 100 from a top perspective view. The integrated circuit (IC) microprocessor 104 is shown in dashed line representation, along with the electrical contacts 106, the dashed lines indicating that the IC is situated on the opposite, or hidden, side of the smartcard 100. On the upper surface 110 of the smartcard 100 two designated regions 102 and 108 are shown. These regions 102 and 108 are made visually distinct by means of printing a circle on the upper surface 110 of the smartcard 100 in each instance. When the smartcard 100 is inserted into an appropriate smartcard reader (not shown), the reader is able to detect when a person presses one of the designated regions 102 and 108 with their finger, and in association with the appropriate programming in the IC 104, is able to identify the region which has been pressed. The aforementioned functionality enables the smartcard 100 together with the card reader to function as a user interface mechanism, allowing the person to enter control signals, for example, by pressing the appropriate region (e.g. 108) on the smartcard 100.

Fig. 2 depicts a particular example of a smartcard as described in relation to Fig. 1. In Fig. 2, a smartcard 200 has a number of designated regions 204-212 on an upper surface 202 of the card 200. In this particular example, the card 200 is intended for use as a programmable user interface in a telephone (not shown). In particular, in this example, the smartcard 200 is intended for use by a child. Region 204 is,

therefore, associated with the telephone number for the child's mother when she is at her office, while region 206 is similarly associated with the child's father at his place of employment. The large region 212 is associated with emergency calls directed toward police, fire, and ambulance, while the lower regions 208 and 210 are associated with two of the child's friends at their homes.

Fig. 3 depicts a personal cordless telephone 300 which may be used in association with the smartcard described in relation to Fig. 2. The telephone 300 incorporates a speaker 302, a microphone 304, and a recess 306 through which the upper surface 202 of a smartcard 200 may be accessed by the user. The smartcard 200 is inserted into the telephone 300 through a slot 310 as indicated by an arrow 308. Electrical contacts on the rear surface of the smartcard 200 make electrical contact with corresponding electrical contacts 314 located in the recess 306 of the telephone 300. The cordless telephone 300 communicates by means of infrared, or alternatively radio, signals as depicted by arrow 316 with a telephone base station 318. The base station 318 is connected to the public switched telephone network (PSTN) (not shown) by means of a cord 320. The child discussed in relation to Fig. 2 can, by inserting the smartcard 200 into the cordless telephone 300, have easy access by means of one-touch "buttons" eg. 204 (see Fig. 2), to a number of relevant people including mother, father and so on.

Fig. 4 presents an illustrative depiction of a public telephone 400 complete with a microphone 402 and a speaker 406. The public telephone 400 is not equipped with a normal keypad, however instead is fitted with a smartcard receptacle 410. The smartcard 200 can be inserted into the receptacle 410 as depicted by an arrow 408, thereby exposing the upper surface 202 of the smartcard 200 through an aperture 412. When the child previously discussed inserts the smartcard 200 as described into the

telephone 400, the child has simple and uncomplicated access to the same important telephone numbers as was the case with the cordless telephone 300, which would be used in his home.

Fig. 5 depicts a different application for a smartcard 500, which has on its upper surface 502, a number of regions 504 to 514. In this instance, the smartcard 500 is not intended for use with telephones, either private (eg. 300), or public (eg. 400), but is rather intended to be used as a control interface in a CD player which is suitably equipped with a smartcard reader (not shown). In such a case, a user could, by pressing on region 510 provide a control signal to the CD player to play a CD selection, the selection could be paused by pressing region 506, the selection could be "wound" fast forward or fast reverse by pressing regions 514 and 508 respectively, and finally the CD player could be switched off by pressing region 512.

Fig. 6 presents a process flow diagram for operation of a smartcard user interface presented from a user perspective. A user inserts a smartcard into an appropriate reader in process step 600, and touches a "button", or a "region" as described previously, at a designated position on the card in process step 602. In this instance, the smartcard, and card reader are appropriately equipped so that the keystroke described in the process step 602 results in a sound being emitted in process step 604. The sound which is emitted is characteristic of the particular button which was pressed in the process step 602, and represents a form of feedback cue by which the user can verify that a particular button has been pressed. Finally, in step 606 an action associated with the particular button being pressed is performed. Thus for example, having reference to the "telephone smartcard" 200 described in relation to Fig. 2, the sound emitted in process step 604 when the region 204 associated with the child's mother is pressed, might be a particular jingle associated with the child's

mother, or alternatively, a synthesised voice output presenting the word "Mother" or "Mom". In this instance, the action associated with process step 606 is to establish a telephone call to the child's mother at the appropriate number associated with the aforementioned region 202.

Fig. 7 presents a process flow diagram from the perspective of a card reader into which a smartcard as described is inserted. In a process step 700 the card insertion is detected, whereafter in a process step 702, the card reader detects that the user has touched one of the designated regions. In the following process step 704, the card reader makes reference to mapping information in order to identify the particular region pressed by the user, whereafter in step 706 the action associated with the particular region in question is retrieved from a memory. In a process step 708, the particular action being requested through touching the specified region is sent to the application in question. In the present case, and making reference to the child's telephone interface previously discussed, the action would be "to establish a telephone connection with the child's Mother", and the application in question would be a telephony communications application. In the following process step 710, the feedback sound associated with the particular region in question is retrieved, whereafter it is played in step 712 to the user.

Fig. 8 indicates how the feedback signal may, instead of being an audio signal as previously described in relation to Figs. 6 and 7, be a visible feedback signal such as a flashing light emitting diode (LED) 802, which in the present case is located directly on the upper surface of a smartcard 800. Alternatively, the LED could be located on the cordless telephone 300 (see Fig. 3), or on the public telephone 400 (see Fig. 400).

Given the wide range of applications to which the programmable smartcard interface may be applied, and the almost infinite range of data associated with the applications, a means of programming the required data into a smartcard is required,

and a process flowchart in this regard is presented in Fig. 9. In process step 900 a coordinate for a specified region is entered, while in parallel (or alternatively sequentially) information associated with the region in question is entered in process step 902. Again making reference to the child's telephone card 200, a coordinate of region 204 is an x-y coordinate measurement measured from a convenient point, say a bottom left corner of the card, while the information associated with the region 204 is the telephone number for the child's Mother at her place of work. Once both these pieces of information are provided, they are loaded into program memory in step 904. Thereafter in step 906, the programming process tests whether further information is to be programmed onto the card. In the event that further information is required, the programming process is directed back to process step 900 and 902 as shown by arrow 912. In the event, however, that the programming is complete, the programming process is directed to a process step 908, where the programmer is able to select appropriate graphics to print onto the smartcard upper surface. In previous examples, the various regions eg. 204 on the smartcard 200 have been represented by simple oval outlines. It is possible, however, to make use of more complex graphics, and for example a miniature picture of the child's Mother can be printed on the card in the region 204.

An issue which is likely to arise as use of programmable customer-interface smartcards increases, is that of systematic storage of the cards, and subsequent retrieval in a simple and efficient manner of the appropriate cards. One can image that over a period of time a person could accumulate hundreds of such cards for various applications, and an efficient and simple storage and retrieval mechanism would make their ongoing use more practical. Fig. 10 depicts a storage and retrieval apparatus 1000 which is equipped with a carousel 1002 into which individual smartcards 1004 may be

inserted and stored as depicted by an arrow 1006. The apparatus 1000 is connected by means of a cord 1012 to a computing device (not shown). The slots in the carousel 1002 are equipped with suitable contact mechanisms so that when the smartcards 1004 are inserted, the information on the smartcard 1004 is accessible to the computing device. When a user wished to retrieve a particular smartcard, say 1004, the user can enter an appropriate keyword, where upon the computing device controls the indexing apparatus 1000, rotating the carousel 1002 until the appropriate smartcard, say 1004, is located immediately opposite an arrow 1008 embossed on the upper surface of the apparatus 1000. Keyword searches of this type may be based upon any information class stored on the smartcards, including names, company designations, and so on. Alternatively, the computing device may accumulate and store information on most frequently used smartcards, and enable the user to retrieve smartcards on this basis.

Programmable user-interface smartcards may be used in a wide variety of applications. In addition to customised use in telephone and similar equipment, where one touch operation may be advantageous from the perspective of ease of use, more complex key-stroke, or touch sequences may also be programmed into the cards.

Thus, for example, interactive voice response (IVR) systems which require a user to step through a menu of options prior to reaching a desired called-party, may be more easily accessed by pre-programming a known sequence of key-strokes into a smartcard.

Such cards can also be used as promotional handouts, wherein the telephone number of a supplier can be pre-programmed along with various "buttons" which can be pressed giving one-touch simple ordering capability. The aforementioned buttons can typically, upon being pressed, output a user programmable sequence of signal components. This sequence can, for example, be defined by a program script. The

sequence of signal components can perform a sequence of operations such as, for example, navigating through an Automatic Voice Response (AVR) menu, and conveying complex personal information such as account numbers, and so on.

The foregoing describes a number of embodiments for the present invention. Further modifications can be made thereto without departing from the scope of the inventive concept.

Aspect of the Invention

The following numbered paragraphs describe aspects of the invention:

1. A user programmable interface system comprising;

a smart-card;

a smart-card reader adapted to receive the smart-card, and responsive to a user stimulus to a region on or above a surface of the card, the reader being further adapted to output a signal in response to the stimulus, the signal comprising a user programmable sequence of one or more signal components;

a customer terminal adapted to incorporate the smart-card reader, the terminal being responsive to the output signal from the reader; and

a base station adapted to communicate with the customer terminal, and to perform, on the basis of the output signal, at least one of establishing and supporting a telecommunication connection, and initiating and controlling a process.

2. A system according to paragraph 1, wherein the output signal is associated with the region.

3. A system according to paragraph 1, wherein the output signal comprises a region location signal and an action signal, one or both of the region location signal and the action signal comprising a user programmable sequence of one or more signal components.

4. A smartcard for promotional use, said card suitable for incorporation into the system as claimed in claim 1.

5. A smart-card programming apparatus comprising:

a smart-card reader means adapted to receive a smart card and to read from and/or write to the smart-card;

a region position definition means by which a region position can be specified;

a smart-card printer means;

a region graphic definition means by which a region graphic can be specified; and

a region action definition means, by means of which a region action can be specificed wherein the apparatus programs the smart-card dependent upon the specified region position and region action, and wherein the apparatus further prints the specified region graphic on the smart-card in the corresponding region position.

6. A smart-card indexing apparatus comprising;

a smart-card storage means adapted to receive at least one smart-card;

a smart-card reader means adapted to read data from a smart card located in the storage means;

a search query means whereby a user can specify at least one smart-card parameter; and

a control means responsive to the data read by the smart-card reader and adapted to identify a smart-card dependent upon the specified parameter.

DATED this ELEVENTH day of MAY 1999
Canon Kabushiki Kaisha

Patent Attorney for the Applicant
SPRUSON & FERGUSON

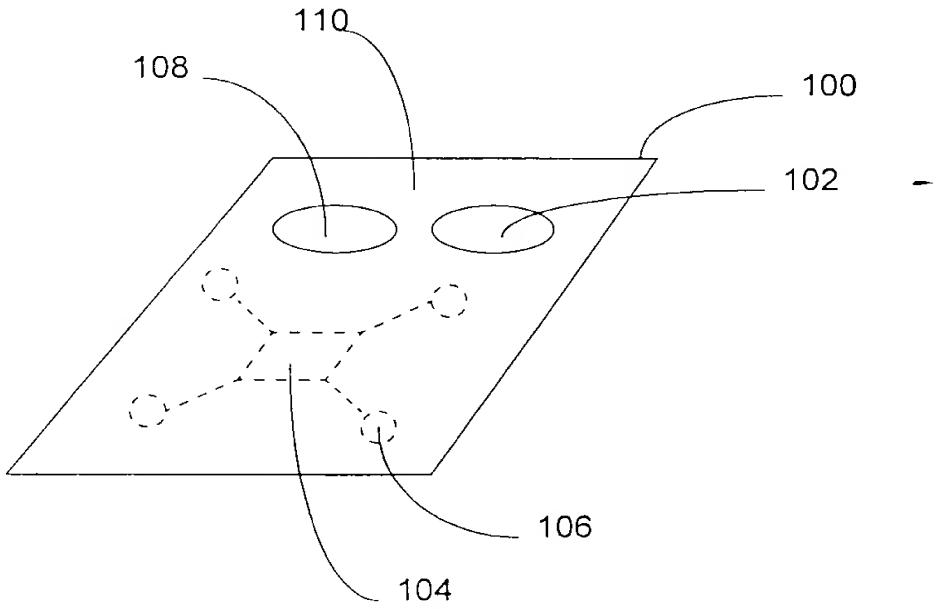


Fig. 1

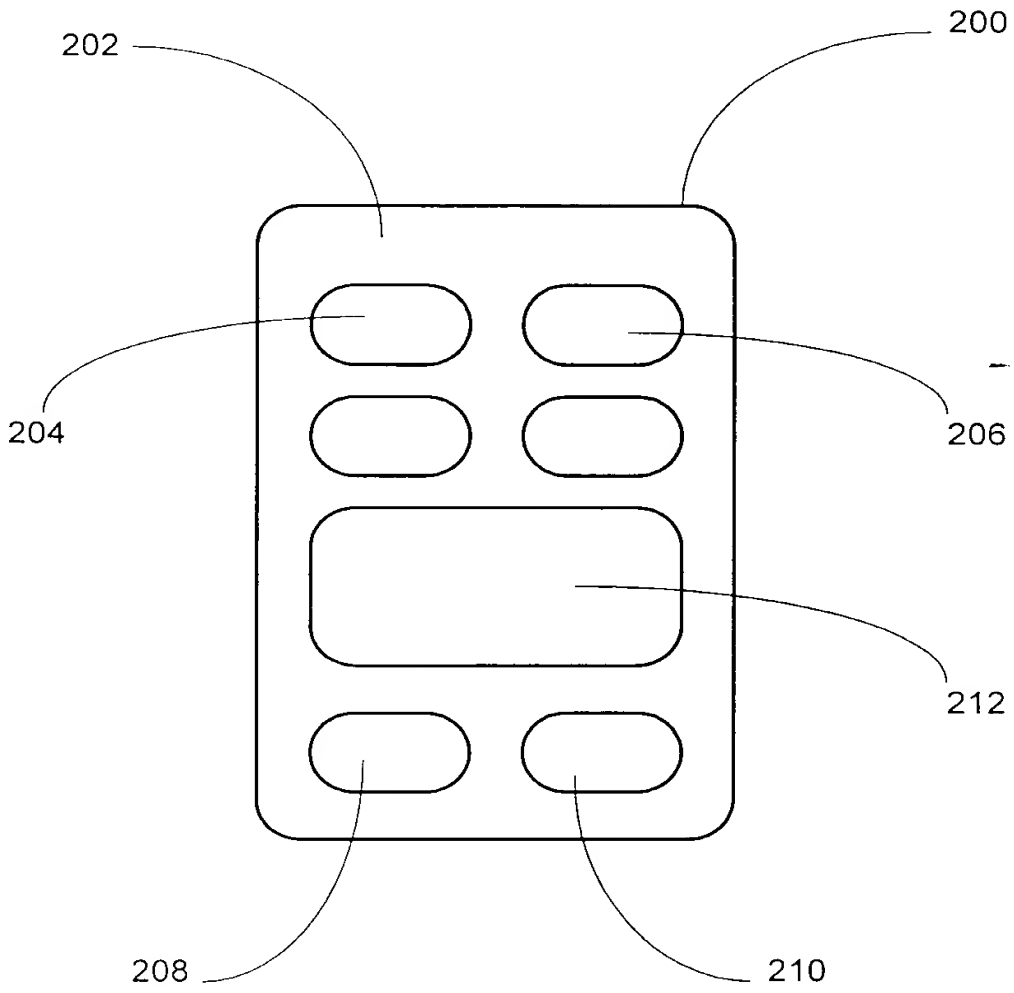


Fig. 2

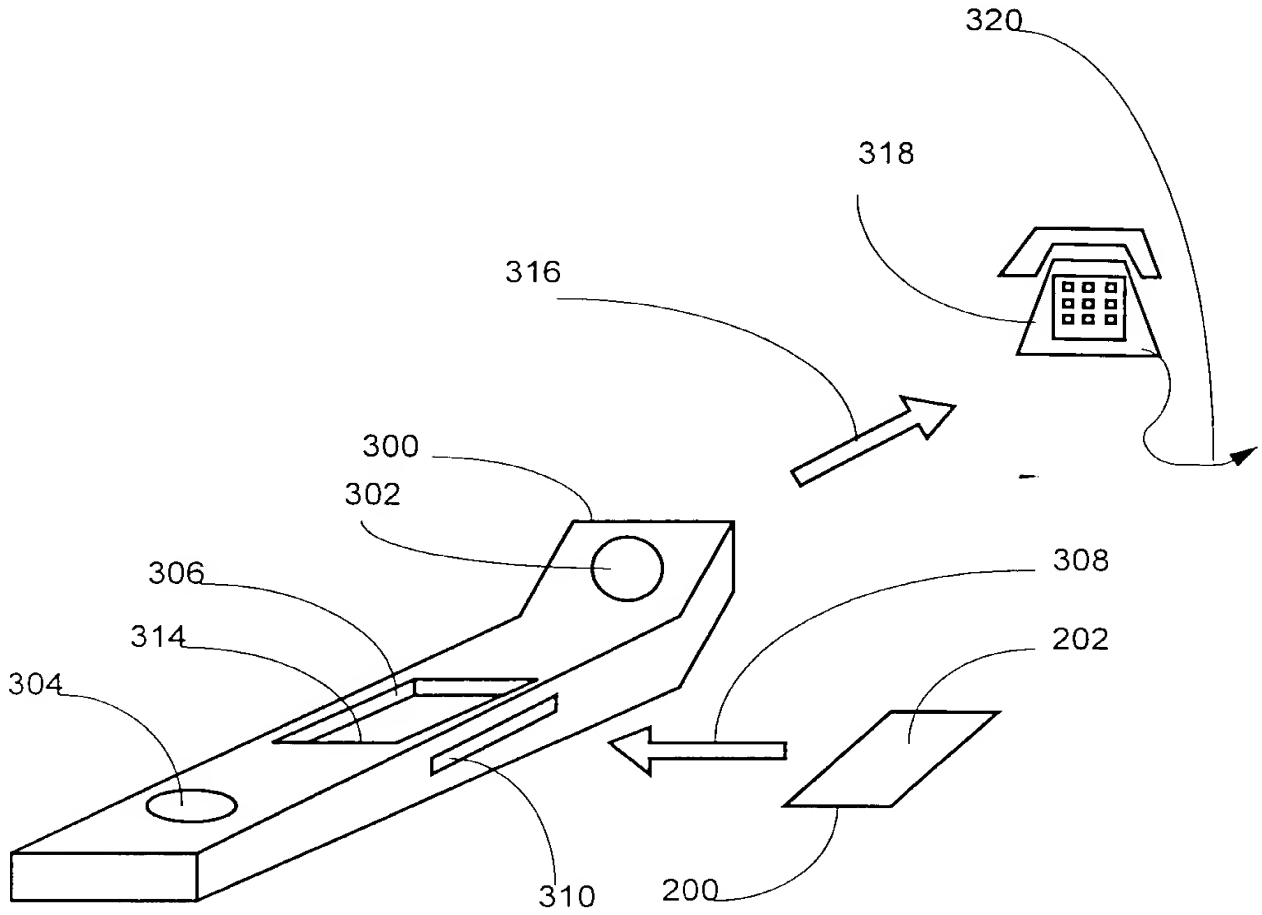


Fig. 3

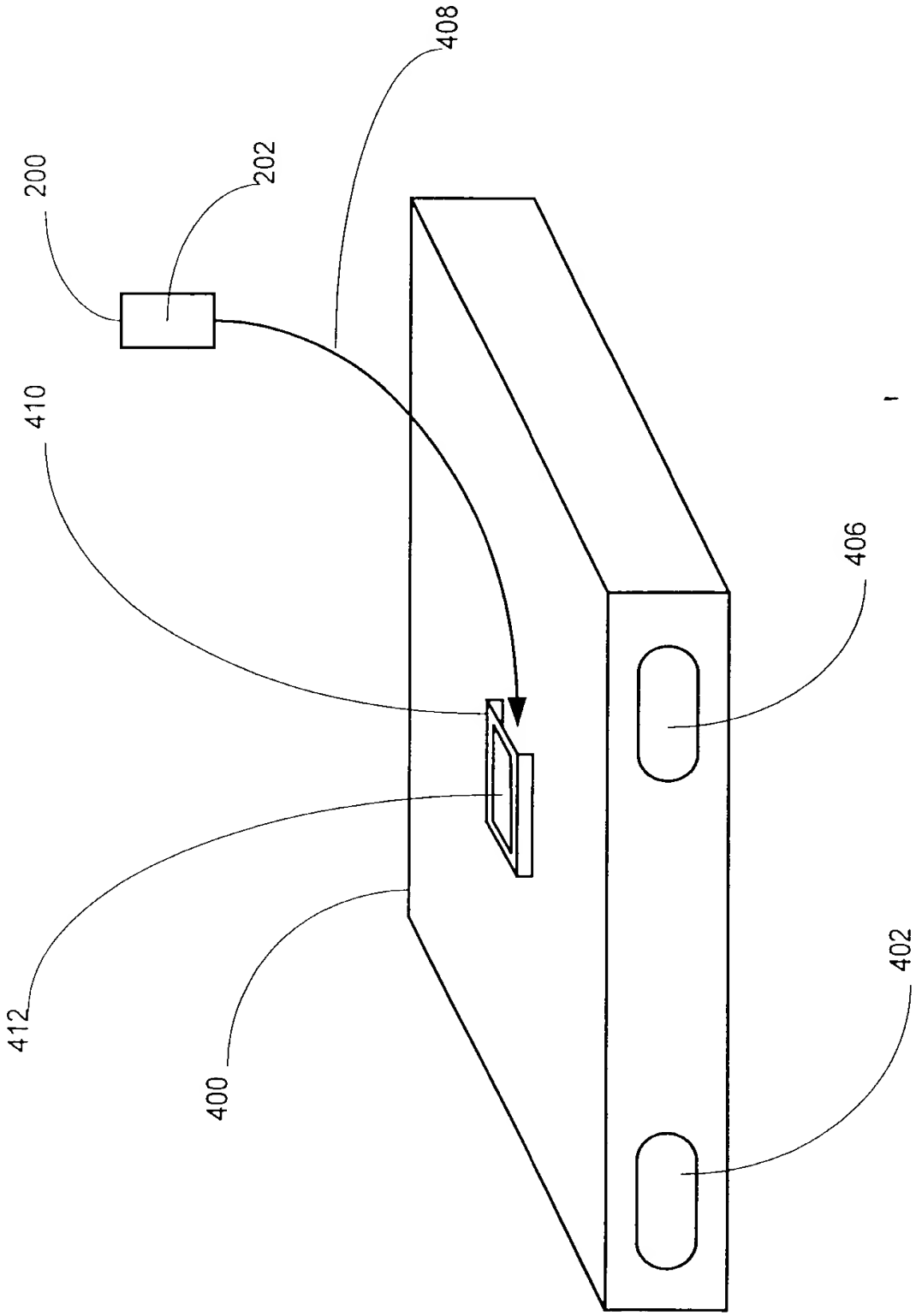


Fig. 4

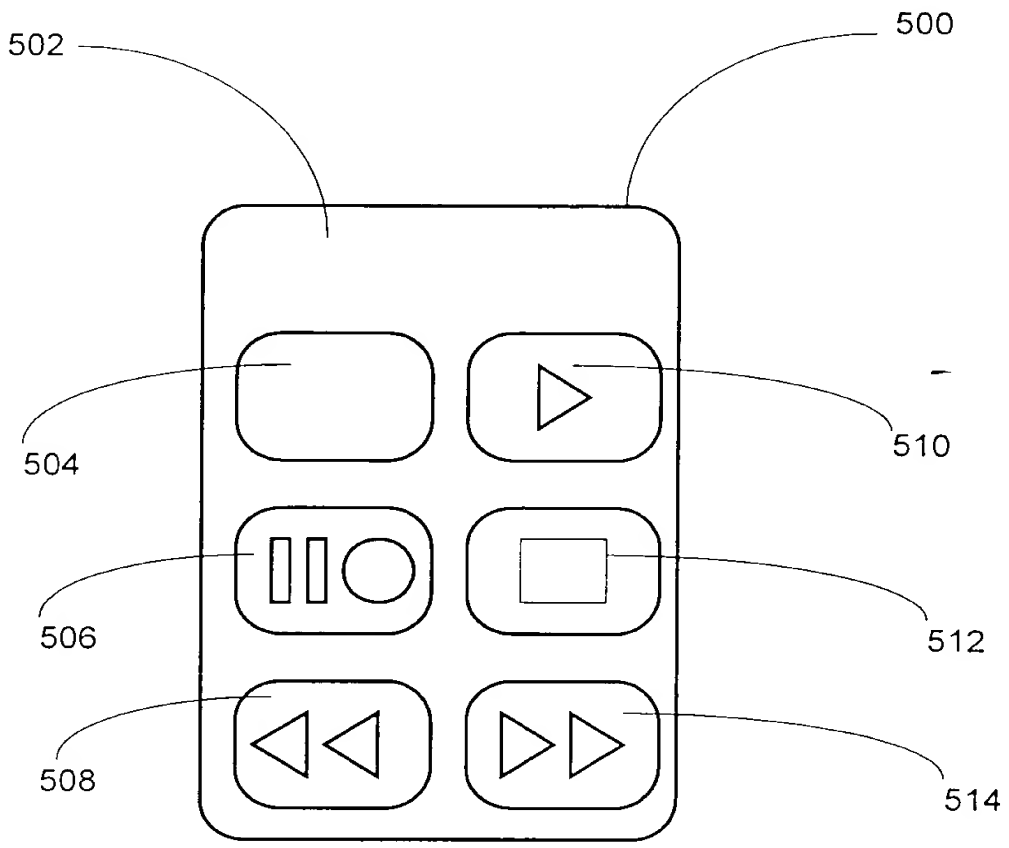


Fig. 5

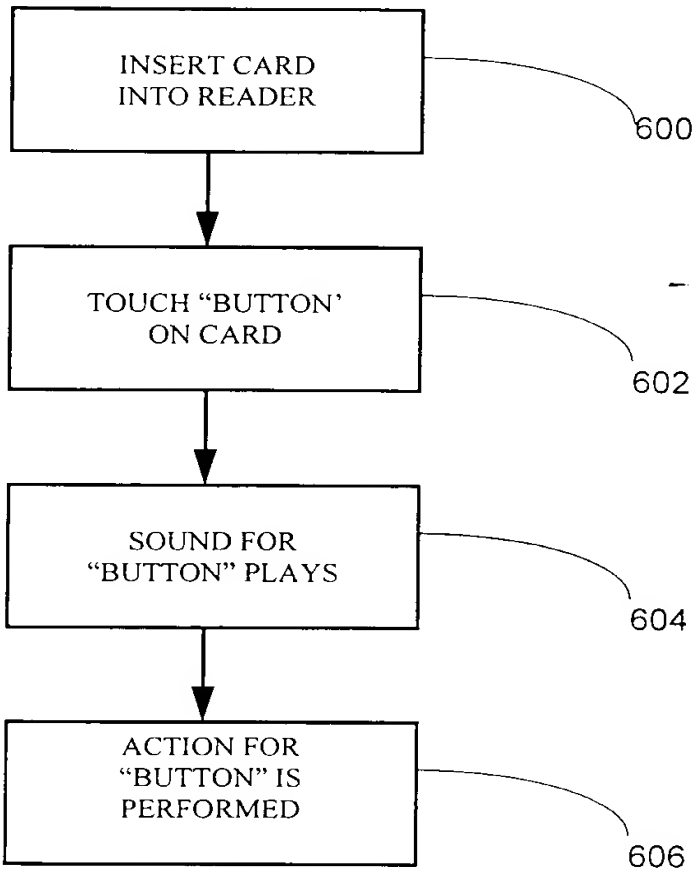

INSERT CARD INTO READER
600
TOUCH "BUTTON' ON CARD
602
SOUND FOR "BUTTON" PLAYS
604
ACTION FOR "BUTTON" IS PERFORMED
606

Fig. 6

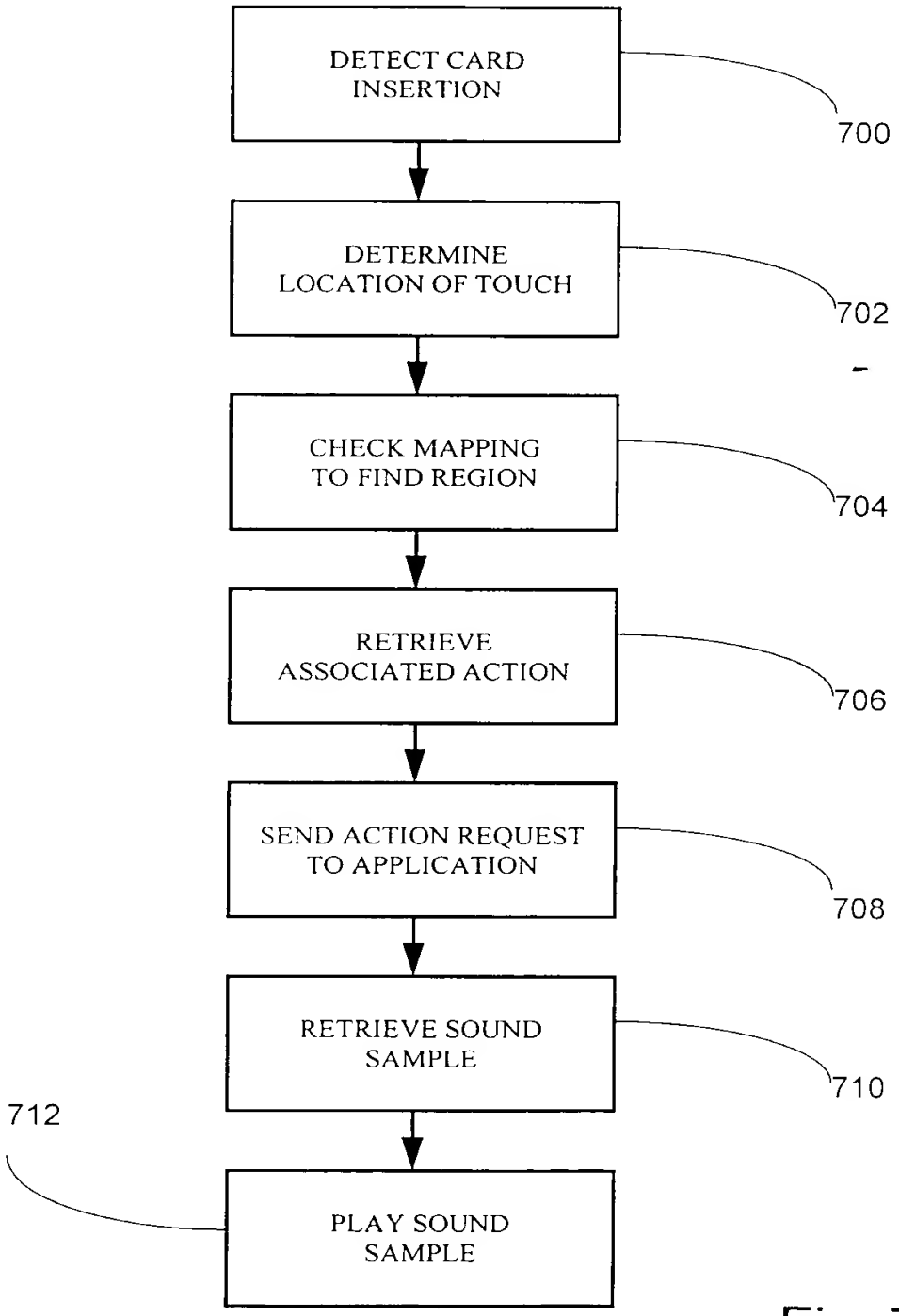

DETECT CARD INSERTION
700
DETERMINE LOCATION OF TOUCH
702
CHECK MAPPING TO FIND REGION
704
RETRIEVE ASSOCIATED ACTION
706
SEND ACTION REQUEST TO APPLICATION
708
RETRIEVE SOUND SAMPLE
710
712
PLAY SOUND SAMPLE

Fig. 7

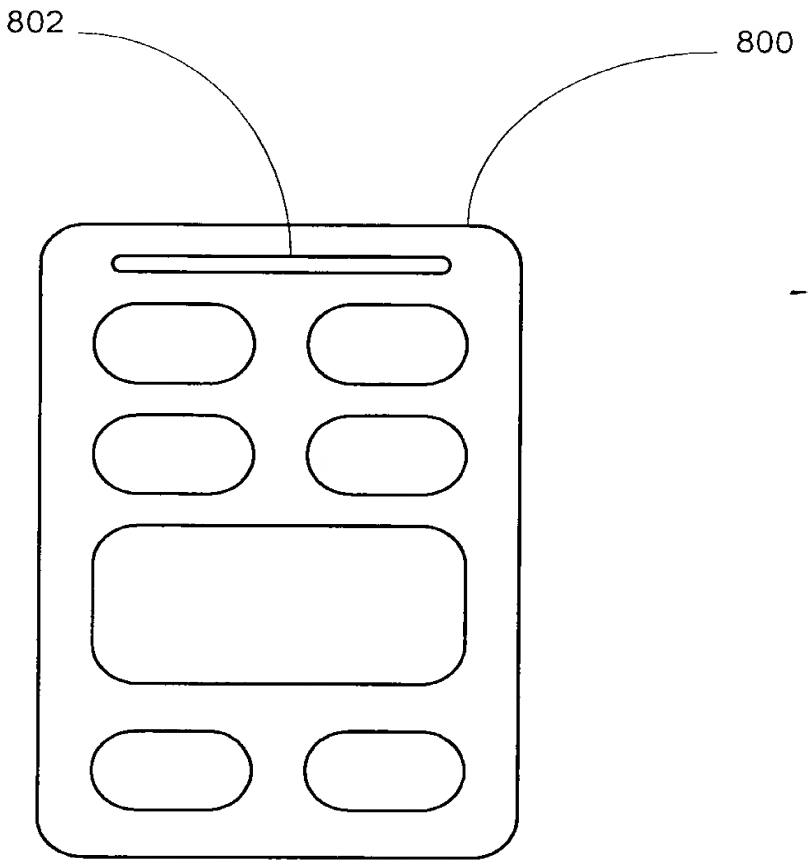


Fig. 8

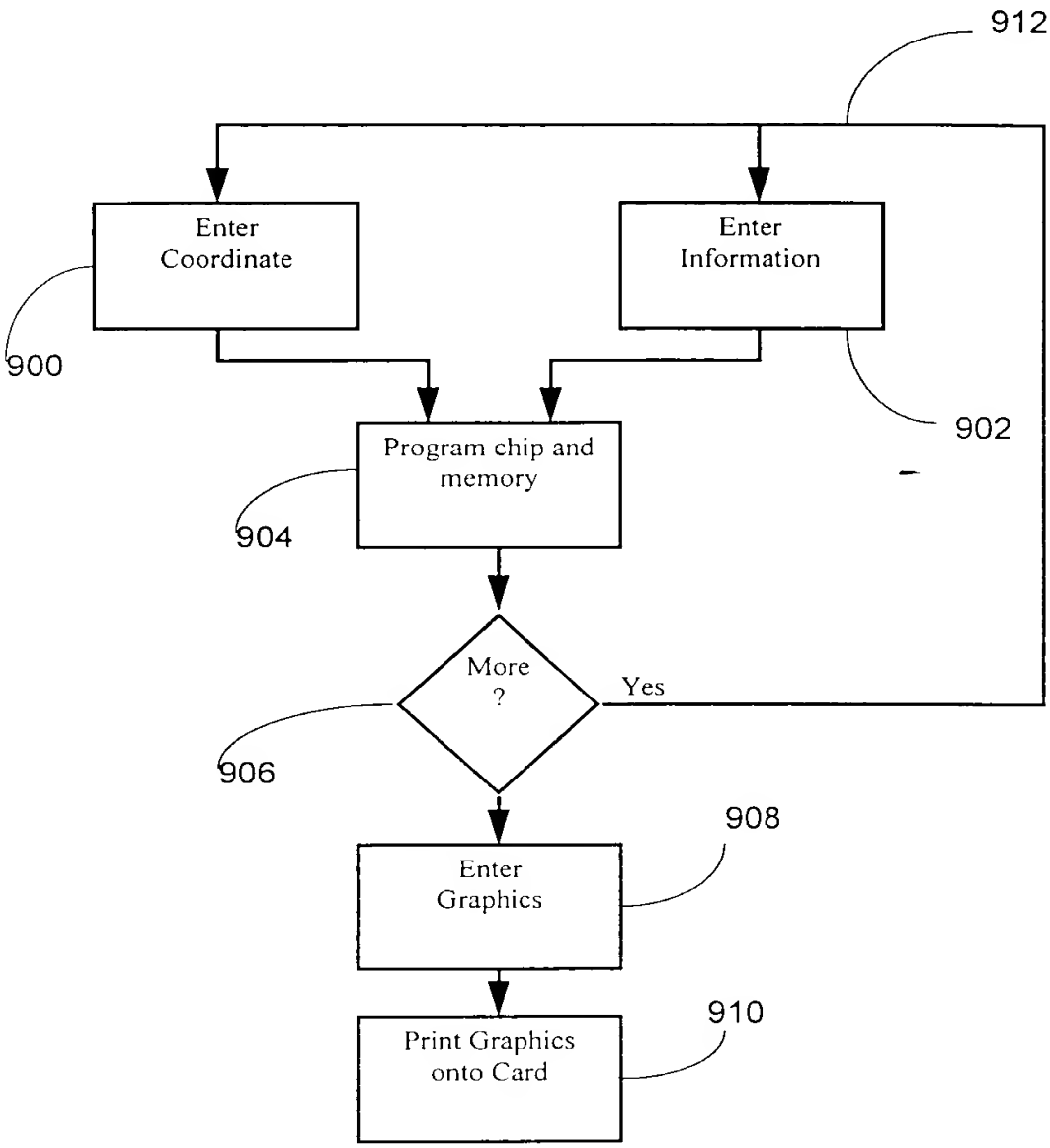

912
Enter Coordinate
Enter Information
900
902
Program chip and memory
904
More ?
Yes
906
908
Enter Graphics
910
Print Graphics onto Card

Fig. 9

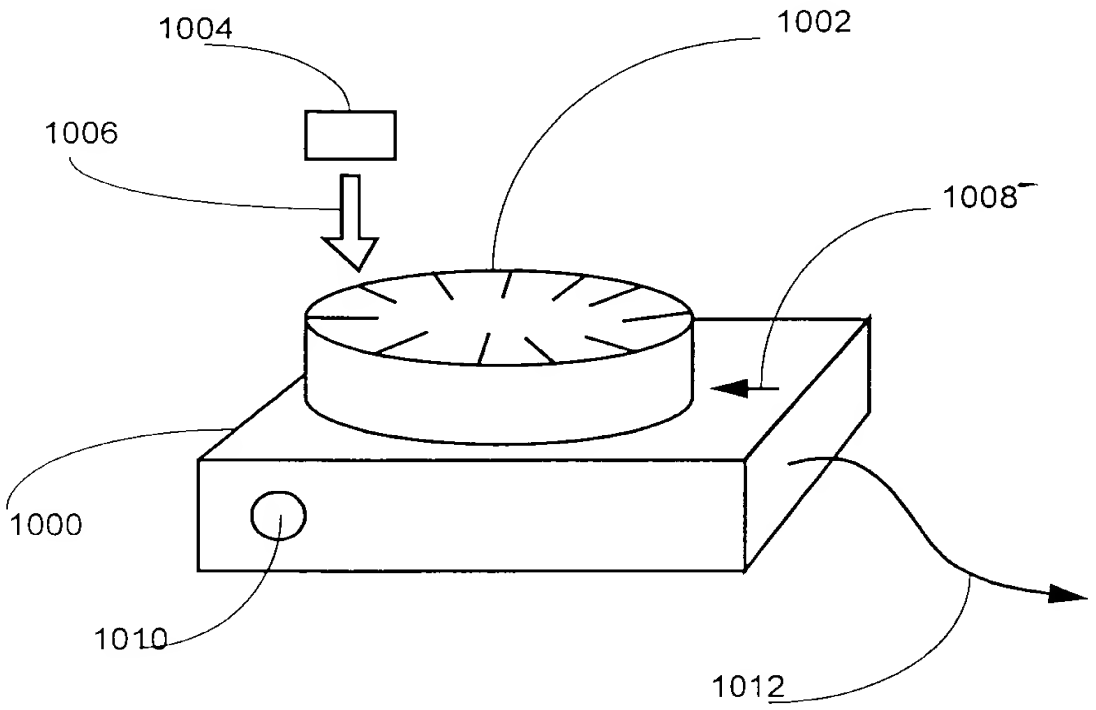


Fig. 10